Indiana State Department of Health Lead & Healthy Homes Program

2011 Surveillance Report

May 2012

The Indiana Lead and Healthy Homes Program is pleased to present the 2011 annual surveillance report. As part of our commitment to Healthy People 2020, this report provides information as to the number of children tested for lead poisoning, the number of children who were found to have elevated blood lead levels, and the number of children who received case management services.

Since 2004 (the first year in which Indiana has electronic data available), 413,238 children have been screened for elevated blood lead levels. Lead poisoning is defined as having 10 micrograms of lead per deciliter of blood (10µg/dL). The number of lead-poisoned children in Indiana has declined from 893 total in 2004 to 868 total in 2011. These elevated blood lead levels led to 941 risk assessment inspections of residences of lead-poisoned children being conducted in 2011. The Indiana Lead and Healthy Homes Program and local health departments provided case management services (i.e., home visits, education, referrals) to 249 confirmed cases of lead poisoned children aged 7 and under during 2011.

Lead poisoning is a preventable condition that may result in harmful health effects. These effects are variable and may include colic, attention deficit hyperactivity disorder (ADHD), impaired peripheral nerve functionality, decreased IQ ,coma, and even death. No safe level of lead has yet been determined by the Centers for Disease Control and Prevention.

Although its manufacture for use in the home was discontinued in 1978, lead-based paint remains the leading risk factor for lead poisoning. This is primarily due to the breakdown of existent lead-based paint in older homes. Nearly 2 million homes were built before 1978 in Indiana so ingestion or inhalation of lead-based paint particles remains a serious health concern. Children between the ages of 1 to 3 years of age are at the greatest risk for being lead poisoned due to the prevalence of hand-to-mouth activity behavior at these ages and because the blood/brain barrier is not fully developed.

In 2012, we look forward to implementing a healthy homes focus to further improve the health of Indiana families. Healthy homes include those which are dry, clean, pest-free, safe, contaminant-free, ventilated and maintained. We will also continue lead-poisoning prevention activities.

Thank you for reviewing this report. Please direct questions regarding the data reported here to Jeff Turner, the Indiana Lead and Healthy Homes Environmental Manager. He may be reached by email at jturner@isdh.in.gov or by telephone at 317.234.4423.

Sincerely,

Dave McCormick

David McCormick
Director
Indiana Lead and Healthy Homes Program

Prepared By

David McCormick
Division Director

Vijay Pathangi
Program Data Manager

Laura Gano, MPH
Epidemiologist

We would like to acknowledge all of those local health departments, medical professionals and laboratory personnel who test, diagnose and treat lead-poisoned children in Indiana. We also acknowledge our debt to the State of Illinois Department of Public Health Lead Program for the design of this report.

This publication was supported by Centers for Disease Control Grant No. EH0000135-05

To report the results of blood lead testing or for more information about childhood lead poisoning please contact the Indiana Lead and Healthy Homes Program at 317.233.1250
***or* phone the Indiana Family Helpline toll-free at 800.422.0746**
***or* visit http://www.in.gov/isdh/19124.htm**

Table of Contents

Introduction……......1

Summary statistics: Indiana childhood lead poisoning (calendar year 2011)……...3

Lead poisoning and screening rates……...…… 4

Blood lead levels by age…….5

Distribution of elevated blood lead levels and adverse effects…….6

Race & ethnicity in relation to lead poisoning……...7

Lead poisoning rate comparison: Indiana & US, 1997 – 2011……9

Pre-1980 housing units in Indiana……..10

Lead poisoning in Medicaid-eligible children……12

Required county-level data……....14

Glossary……..18

List of Tables

Table 1 (Summary statistics)……..……..3

Table 2 (Lead poisoning in Medicaid children)…...……...11

Table 3 (Required county-level data)……..…….. 14

List of Figures

Figure 1 (Lead screening rate)……..……4

Figure 2 (Lead poisoning rate)……..……4

Figure 3 (EBLLs by age, 2011)……...5

Figure 4 (EBLLs by age, 2004-2011)……5

Figure 5 (Adverse health effects)……..6

Figure 6 (Population by race)……7

Figure 7 (EBLLs by race, 2011)……..……..…7

Figure 8 (Ethnicity by race)……8

Figure 9 (EBLLs by ethnicity, 2011)……..……...8

Figure 10 (US/Indiana EBLL comparison)……9

Figure 11 (Pre-1980 housing & EBLLS, Indiana & surrounding states)……..……10

Figure 12 (Percentage pre-1980 housing units in Indiana)……11

Figure 13 (Screening rates, Medicaid children)……...13

Figure 14 (Lead poisoning rates, Medicaid children)…….....13

Introduction

The mission of the Indiana Lead and Healthy Homes Program is to eliminate the incidence of childhood lead poisoning in Indiana. The Centers for Disease Control and Prevention (CDC) standard for "elevated blood lead level" (EBLL) is 10µg/dL – 10 micrograms of lead per deciliter of blood. In 2011, 868 Hoosier children exhibited elevated blood lead levels compared to 893 in 2004 (the first year in which reliable electronic data is available). The number of children found to have elevated blood lead levels based on testing continues to decline. However, total screening rates remain low – only 9% of all children aged 7 and under were tested in 2011. By Indiana law, the only children who are required to be tested for lead poisoning are those who receive Medicaid benefits; testing for that specific population was 20% (increased from 14% in 2010). These statistics point out that the level of lead poisoning may be significantly under-reported in Indiana. Although Indiana does not have universal testing requirements in place, parents/guardians of "at risk" children are strongly encouraged to have those children tested for lead poisoning. "At risk" is defined as a child who:

- lives in or regularly visits a house or other structure built before 1978;
- has a sibling or playmate who has been lead poisoned;
- has frequent contact with an adult who works in an industry or has a hobby that uses lead;
- is an immigrant or refugee or has recently lived abroad;
- is a member of a minority group;
- is a Medicaid recipient;
- uses medicines or cosmetics containing lead; or
- lives in a geographic area that increases the child's probability of exposure to lead.

The Indiana State Department of Health has been identifying children demonstrating elevated blood lead levels and monitoring the treatment of lead-poisoned children since the early 1990s. Program activities include determining and examining potential sources of lead exposure, estimating the extent of EBLLs in Indiana, providing follow-up case management, and allocating resources for primary prevention. Eight high-risk areas (Allen County, Elkhart County, LaPorte County, Marion County, St. Joseph County, Vanderburgh County, Wayne County, and the City of Gary) receive CDC pass-through funding to provide case management services for lead-poisoned children. In 2007 the Indiana legislature enacted Article 29 of Indiana Administrative Code Title 410 to specify procedures for reporting, monitoring and preventing lead poisoning. Article 32 of Indiana Administrative Code Title 410 was enacted in 2010 to formalize definitions and enforcement for the lead-based paint program. Indiana is committed to defining roles and responsibilities and enforcement of these rules to meet Healthy People 2020[1] objectives set forth by the US Department of Health and Human Services. The primary objective is to reduce mean blood-lead levels of children by 10% and ultimately the elimination of elevated blood lead levels in children. In 2010, ILHHP revised its statewide Childhood Lead Poisoning Elimination Plan to reflect these targets. The program also worked with retailers, contractors, business owners, landlords and homeowners to comply with the Environmental Protection Agency's (EPA) Renovation, Repair and Painting (RRP) rule[2] which went into effect in April 2010. This rule requires specific work practices to prevent lead contamination in pre-1978 homes and facilities. In 2011 ILHHP will expand its programming to assess risks to Hoosier children in a more holistic fashion by collecting data reflecting the seven principles of healthy housing[3] which may act synergistically to affect lead poisoning.

The information contained in this report was compiled by the Indiana Lead and Healthy Homes Program in compliance with IC 16-41-39.4-5[4] which requires:

Sec. 5.

a. The state department shall, in cooperation with other state agencies, collect data under this chapter and, before March 15 of each year, report the results to the general assembly for the previous calendar year. A copy of the report shall be transmitted in an electronic format under IC 5-14-6 to the executive director of the legislative services agency for distribution to the members of the general assembly.
b. The report transmitted under subsection (a) must include for each county the following information concerning children who are less than seven (7) years of age:
    i. The number of children who received a blood lead test.
    ii. The number of children who had a blood test result of at least ten (10) micrograms of lead per deciliter of blood.
    iii. The number of children identified under subdivision (2) who received a blood test to confirm that they had lead poisoning.
    iv. The number of children identified under subdivision (3) who had lead poisoning.
    v. The number of children identified under subdivision (4) who had a blood test result of less than ten (10) micrograms of lead per deciliter of blood.
    vi. The average number of days taken to confirm a blood lead test.
    vii. The number of risk assessments performed for children identified under subdivision (4) and the average number of days taken to perform the risk assessment.
    viii. The number of housing units in which risk assessments performed under subdivision (7) documented lead hazards as defined by 40 CFR 745.
    ix. The number of housing units identified under subdivision (8) that were covered by orders issued under IC 13-14-10-2 or by another governmental authority to eliminate lead hazards.
    x. The number of housing units identified under subdivision (9) for which lead hazards have been eliminated within thirty (30) days, three (3) months, and six (6) months.

Sources:

[1] http://www.healthypeople.gov/2020/topicsobjectives2020/objectiveslist.aspx?topicid=12
[2] http://www.epa.gov/lead/pubs/renovation.htm
[3] http://www.nchh.org/What-We-Do/Healthy-Homes-Principles.aspx
[4] http://www.in.gov/legislative/iac/
[5] http://factfinder.census.gov/servlet/DatasetMainPageServlet?_program=ACS&_submenuId=datasets_1&_lang=en&_ts=http://factfinder.census.gov/servlet/STTable?_bm=y&-context=st&-gr_name=ACS_2009_5YR_G00_S2504&-ds_name=ACS_2009_5YR_G00_&-CONTEXT=st&-tree_id=5309&-redoLog=false&-_caller=geoselect&-geo_id=01000US&-format=&-_lang=en

Summary statistics: Indiana childhood lead poisoning (calendar year 2011)

Table 1 (Summary statistics)

Variable	Total ChildrenTested		Proportion EBLL Results (based on total population)
	Number (N)	Proportion (%)	(%)
Number of children tested[1]	67,450	4.5	0.4
Number of children tested, age 7 and under[2]	64,044	9.2	0.4
Age			
<1	1,403	1.7	0.9
1	23,170	27.2	0.4
2	13,712	15.6	0.4
3	6,422	7.2	0.6
4	6,818	7.8	0.3
5	5,063	5.8	0.3
6	2,469	2.8	0.2
7	1,343	1.5	0.1
Sex			
Male	29,220	43.3	0.2
Female	31,128	46.1	0.2
Unknown/missing	62	0.1	0.0
Racial/Ethnic Distribution[3]			
White	31,676	47.0	0.0
Black	9,974	14.8	0.1
Asian/Pacific Islander	685	1.0	0.0
American Indian/Alaska Native	45	0.1	0.1
Multiracial	562	0.8	0.0
Other	3,013	4.5	0.1
Unknown/missing	11,628	17.2	N/A
Hispanic	8,193	12.1	0.1
BLL in microgram per deciliter			
<=4 µg/dL	56,844	84.3	
5 - 9 µg/dL	3,392	0.0	
10 - 14 µg/dL	393	0.6	
15 - 19 µg/dL	158	0.2	
20 - 24 µg/dL	77	0.1	
>= 25 µg/dL	73	0.1	

[1]The 2010 estimated population of children aged 16 and under (the eldest child tested in 2011) was 1,503,658; [2]the estimated number of children under 7 was 697,279. [3]Collecting race and ethnicity data remains a challenge.

Lead poisoning and screening rates

The decline in childhood lead poisoning in Indiana since 1997 – from 3.1% of children tested to 0.4% of children tested in 2011 - illustrates the effectiveness of the Indiana Lead and Healthy Homes Program. In 2007 there was a nationwide recall of toys that were found to contain lead; testing rates were elevated in that year due to increased awareness.

Indiana remains committed to meeting Healthy People 2020 objectives set forth by the US Department of Health and Human Services: reducing mean blood-lead levels of children by 10% and ultimately the elimination of elevated blood lead levels in children.

Figure 1

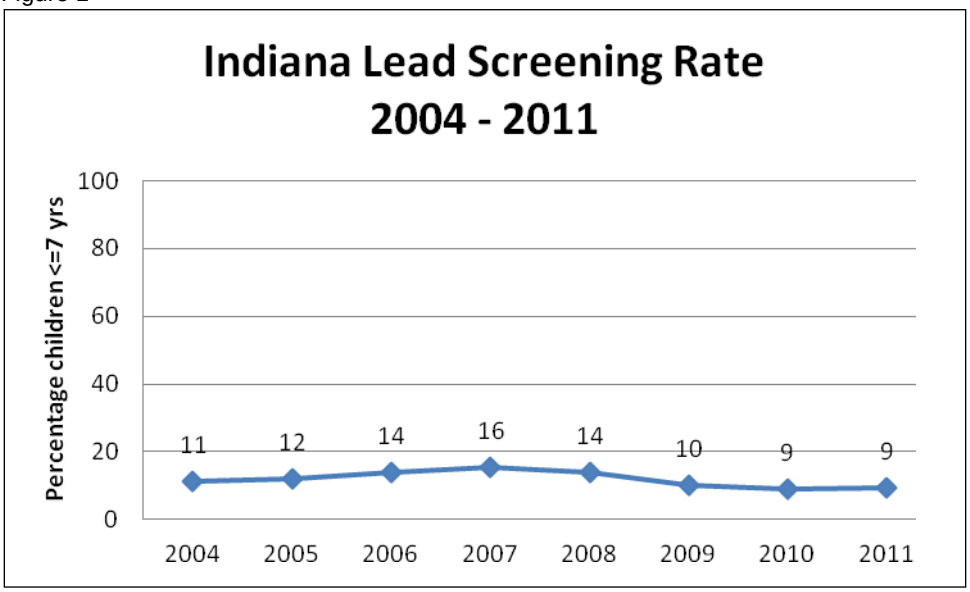
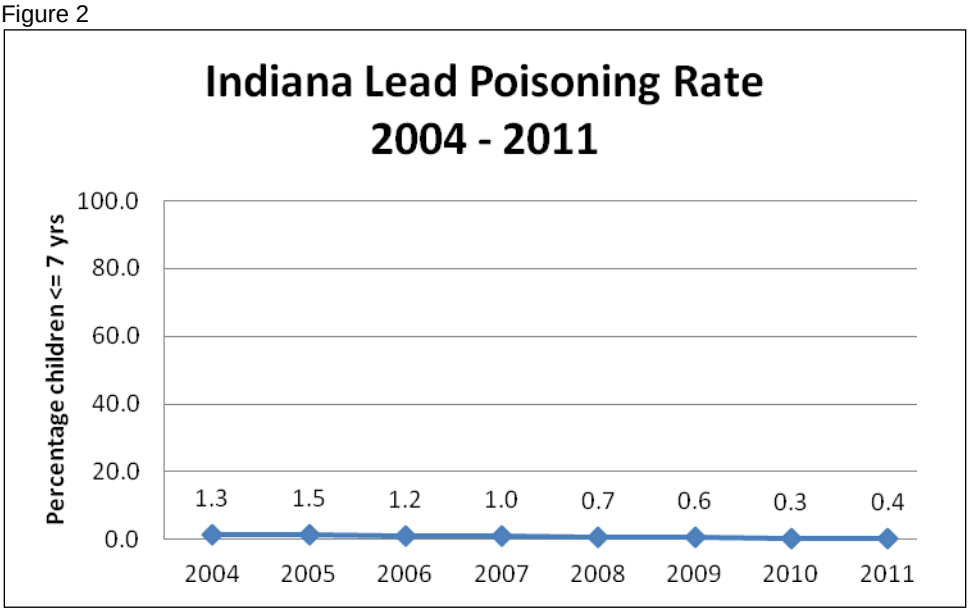


Figure 2



Blood lead levels by age

Lead poisoning is an environmental health issue that can affect anyone. Children aged 1 – 3 years old exhibit the highest rates of lead poisoning -- this may be attributed to more frequent hand-to-mouth activity in this age group which creates a higher risk for contamination by ingestion. Children aged 6 and under are at greater risk for adverse outcomes from elevated blood lead levels.

Figure 4 illustrates the percentage of EBLL results by age for the period 2004 – 2011. Each year of data was combined to create a single aggregate age.

Figure 3

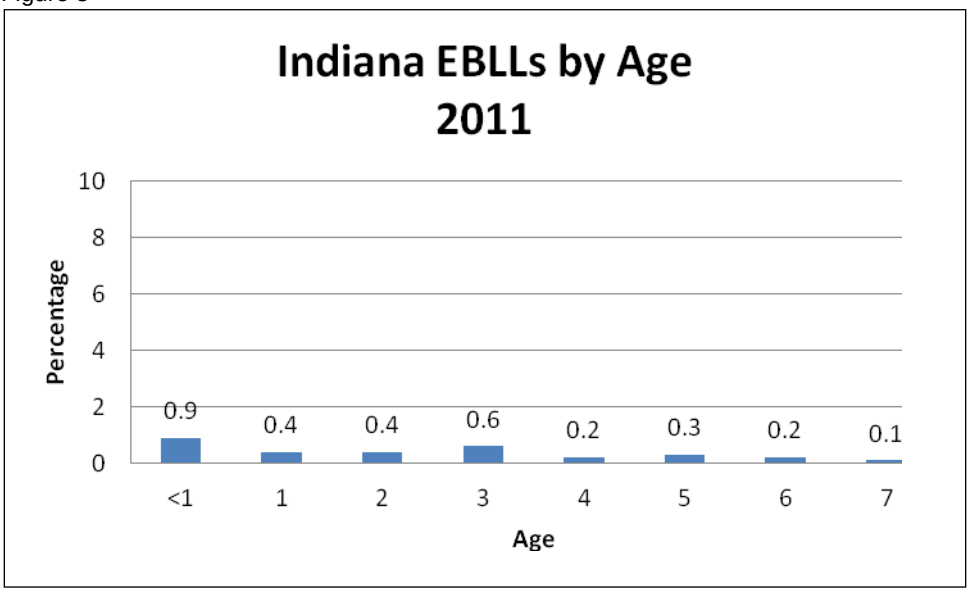
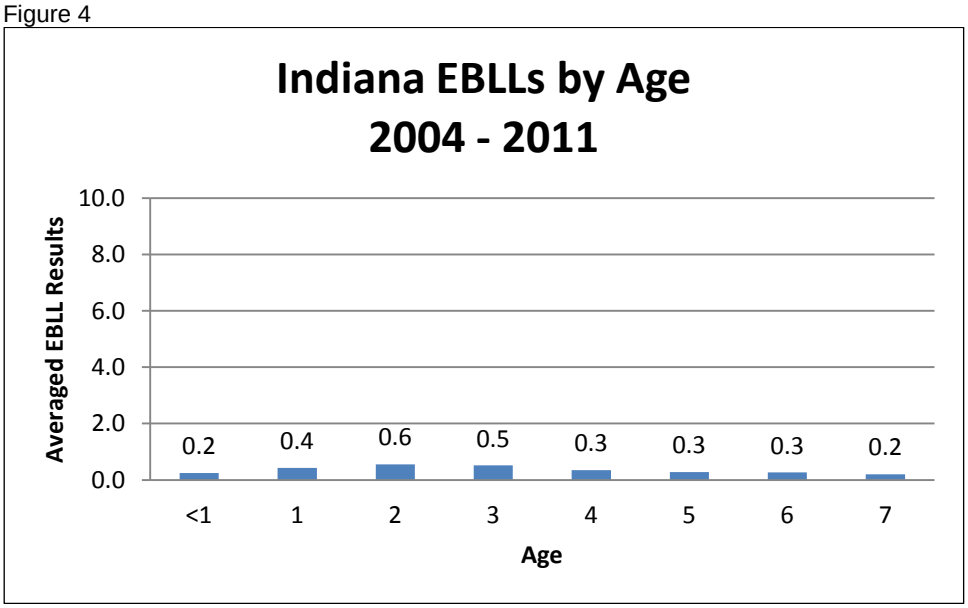
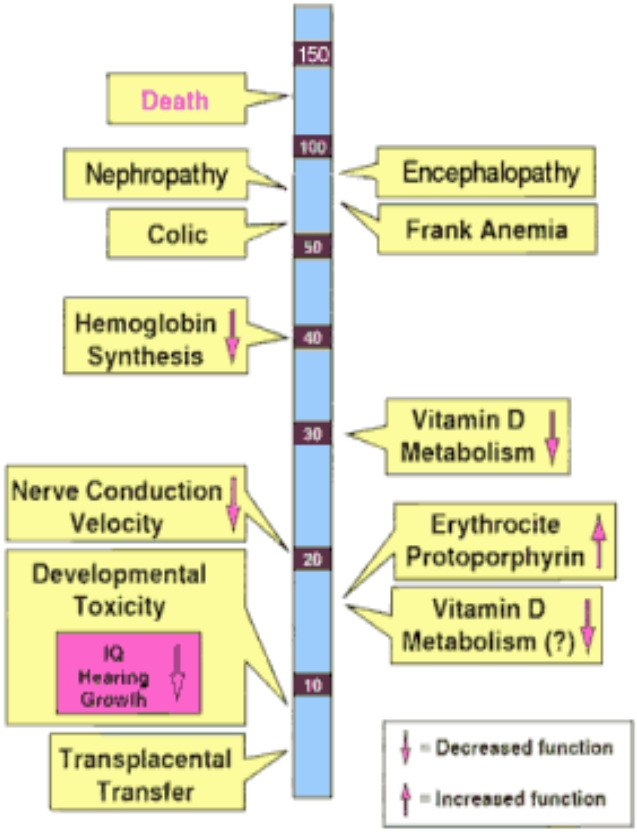


Figure 4

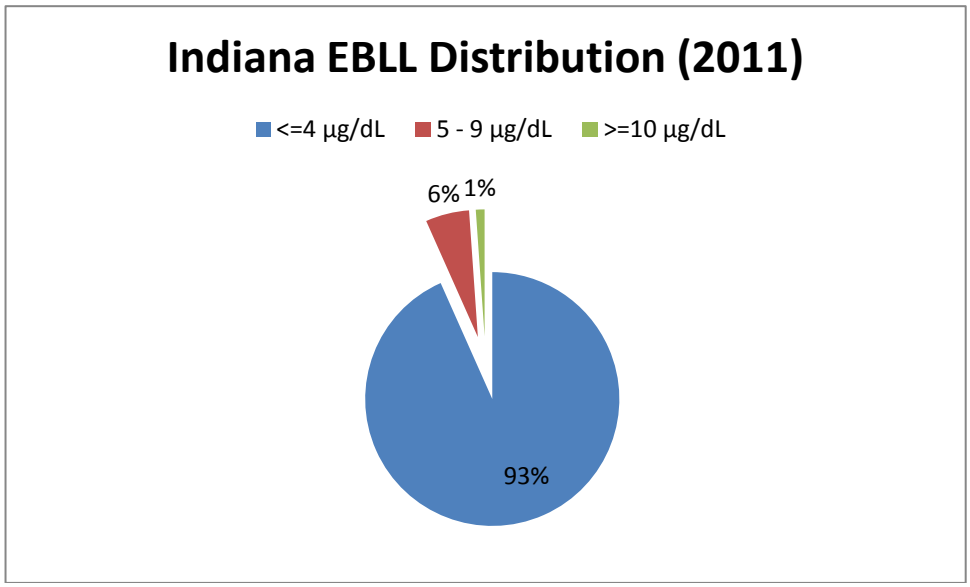


Distribution of elevated blood lead levels and adverse effects

Figure 5



At low levels there may be no overt signs or symptoms of lead poisoning. However, low levels of lead poisoning over time may lead to developmental delays, learning problems and attention difficulties. Moderate levels of lead poisoning can cause constipation, abdominal pain, and poor appetite. Higher levels can lead to irritability, vomiting and lethargy. Serious health conditions including neuropathy and encephalopathy may be experienced as the level of lead poisoning increases. Levels above 100 µg/dL can result in death. See figure 5 for other adverse health effects that may result from lead poisoning.



Race & ethnicity in relation to lead poisoning

Racial and ethnicity disparities exist in lead poisoning among Hoosier children. Data show that of all racial groups, American Indian/Alaskan Native* (AI/AN) bear the greatest burden of disease with 66% of EBLLs distributed among this group. Twenty-five percent (25%) of Hispanic children were identified as lead-poisoned in 2011 versus 31% non-Hispanic children.

Figure 6

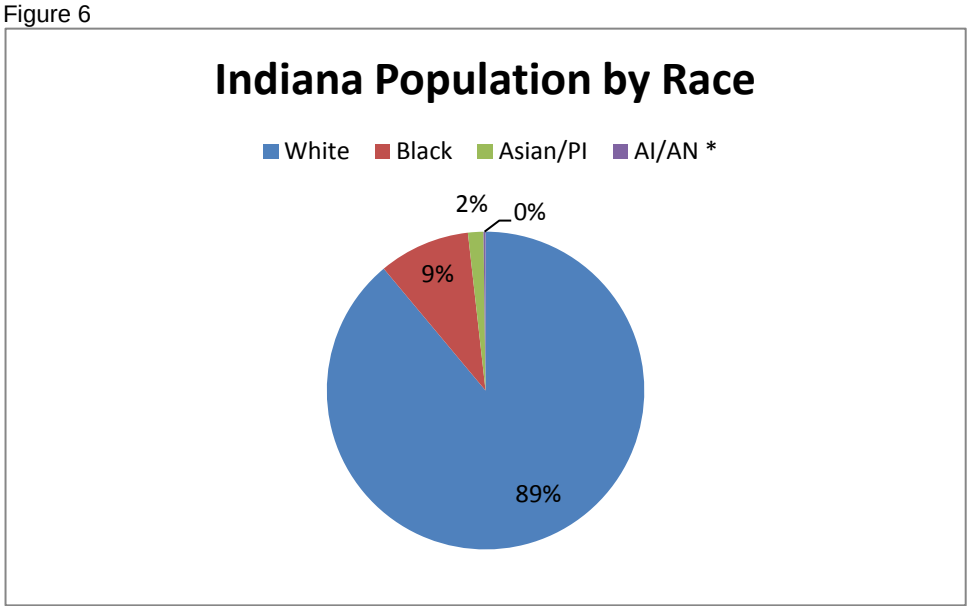
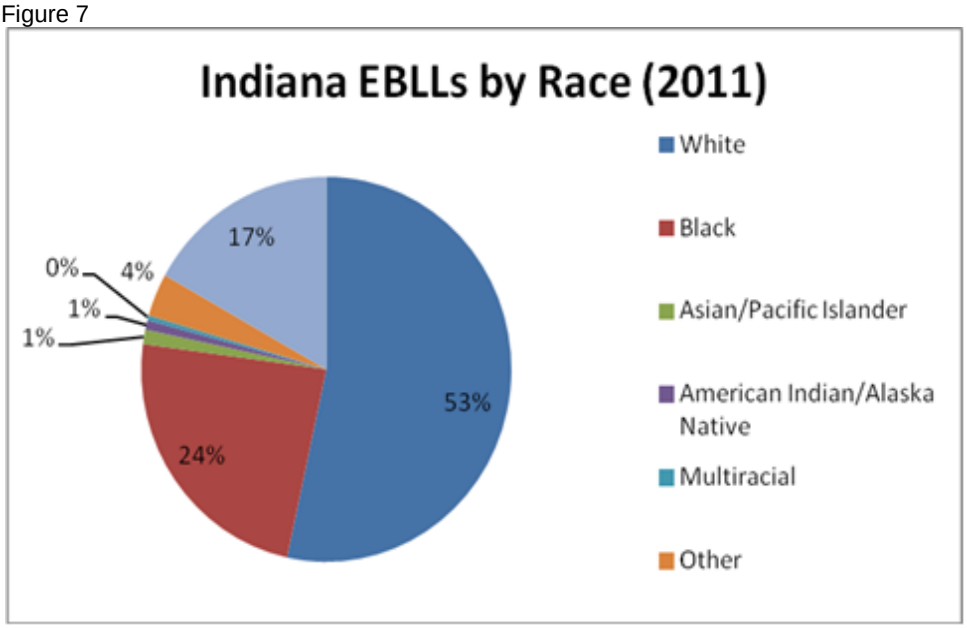


Figure 7



Race & ethnicity in relation to lead poisoning, cont'd.

Figure 8

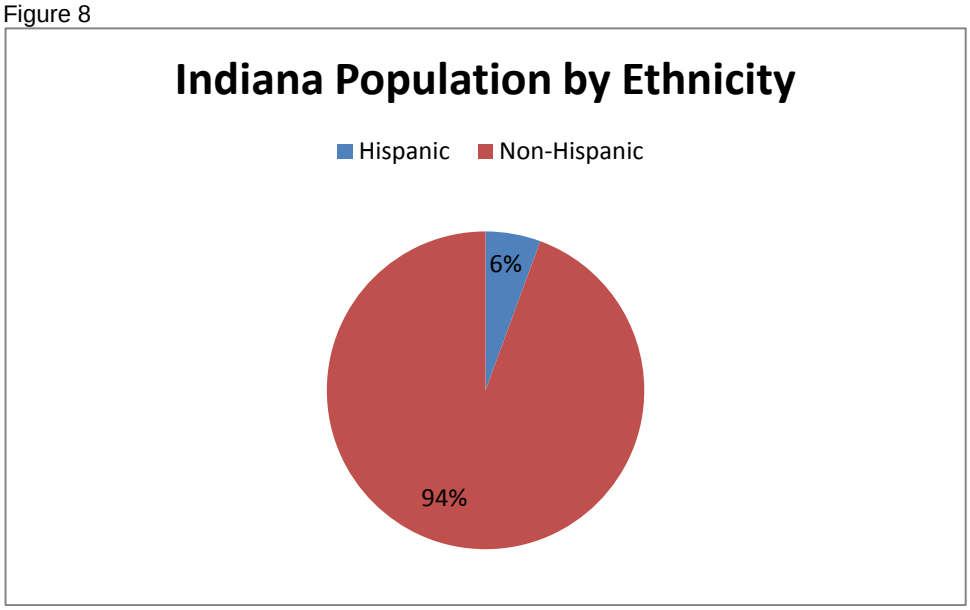
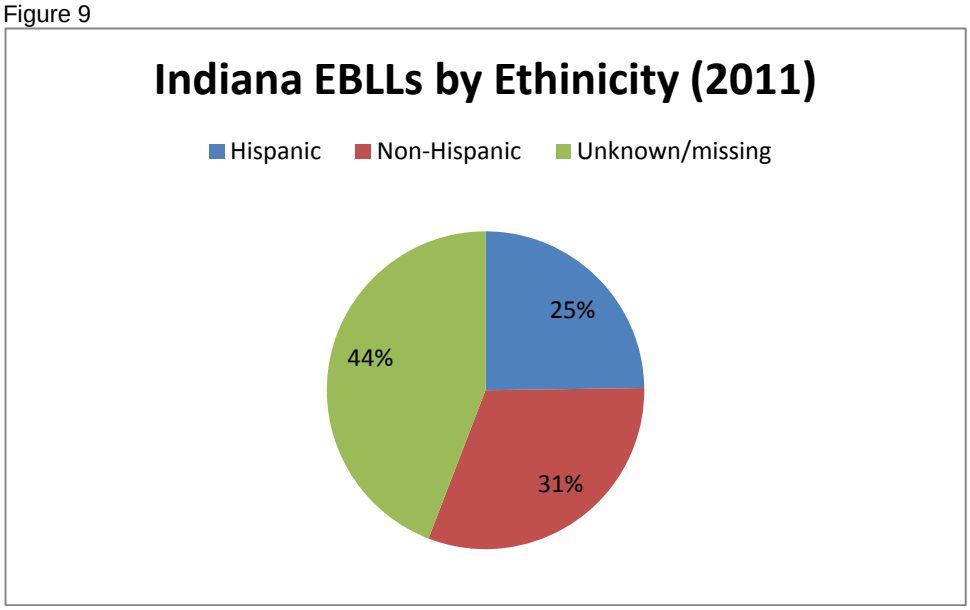


Figure 9



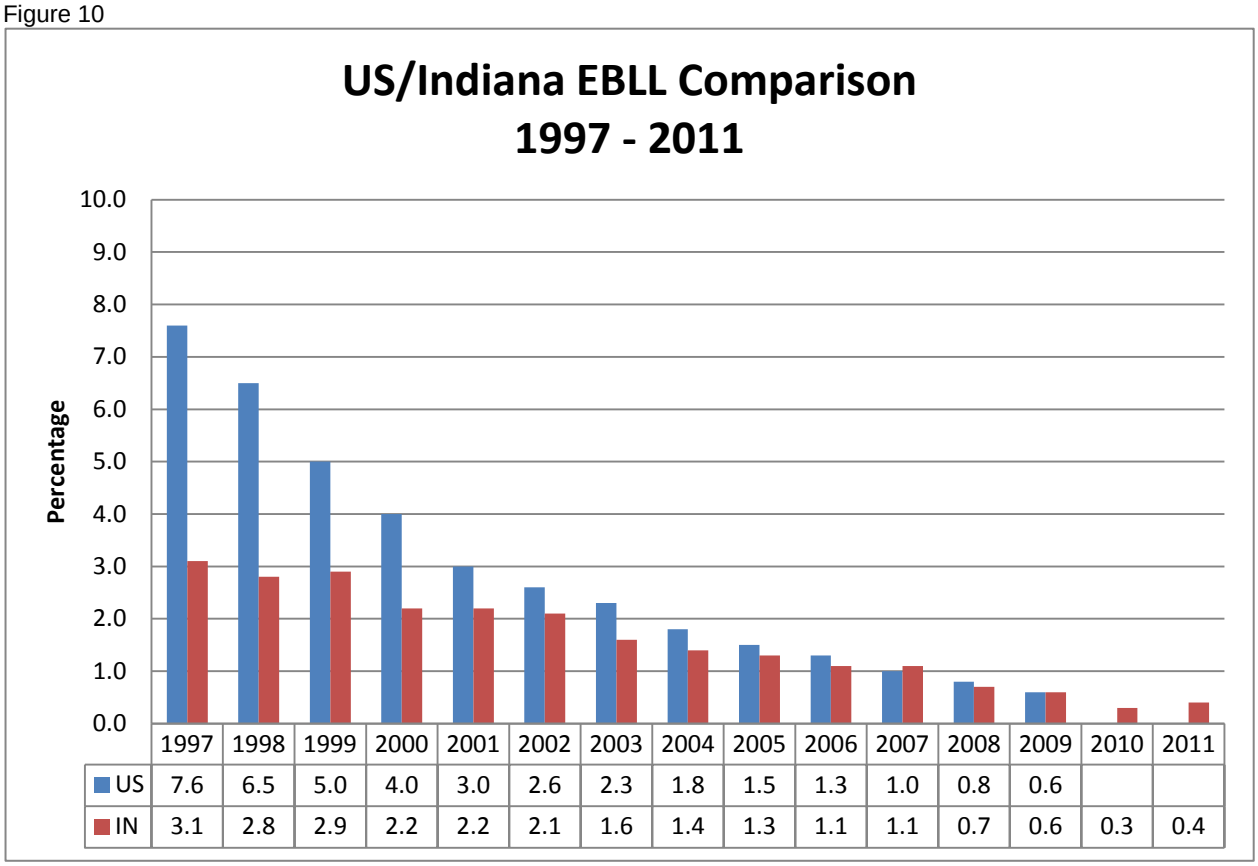
Lead poisoning rate comparison: Indiana & US, 1997 - 2011

Like lead poisoning rates for the United States as a whole, the percentage of lead poisoned children in Indiana has declined steadily since 1997. The exception is 2007 – during that year Indiana's rate (1.1%) slightly exceeded the national rate (1.0%).

As the Indiana program incorporates healthy homes principles in 2012, it will continue its primary mission to eliminate the incidence of lead poisoning.

Figure 9 provides a graphic comparison of lead poisoning rates in Indiana and for the nation for the period 1997 – 2011 (nationwide data is only available through 2009).

Figure 10



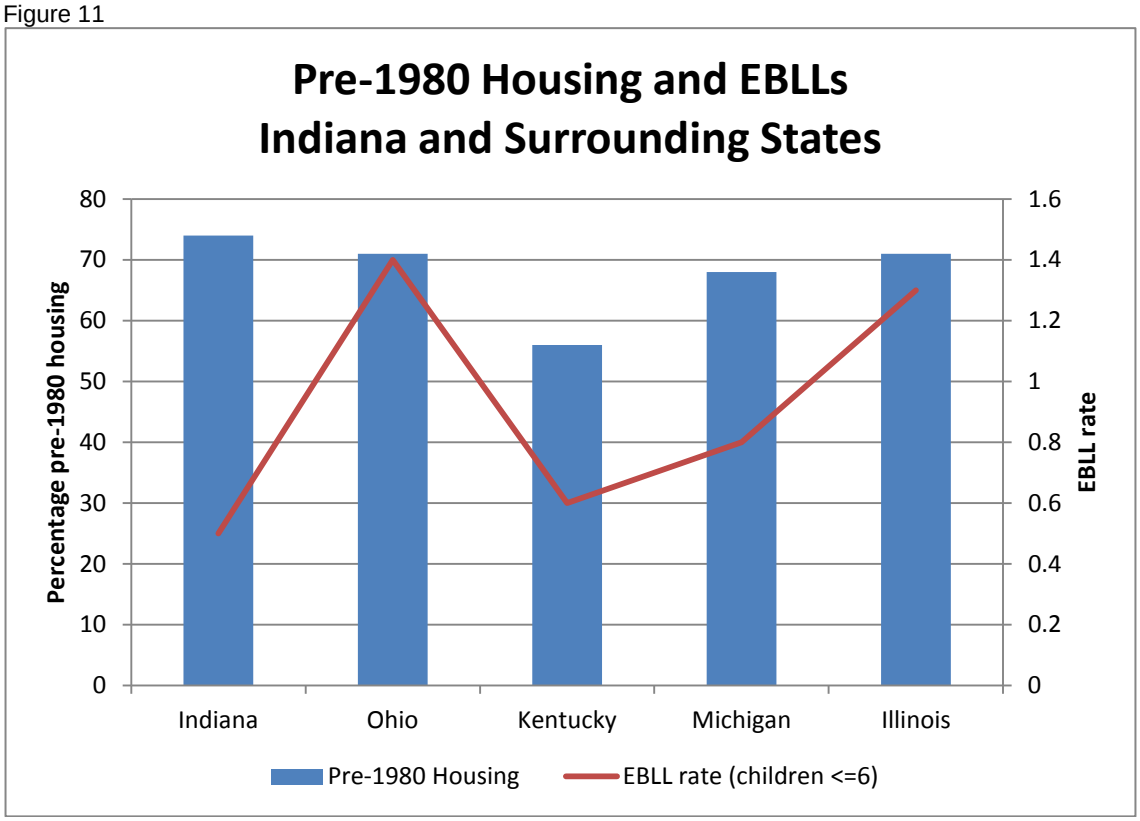
	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
US	7.6	6.5	5.0	4.0	3.0	2.6	2.3	1.8	1.5	1.3	1.0	0.8	0.6		
IN	3.1	2.8	2.9	2.2	2.2	2.1	1.6	1.4	1.3	1.1	1.1	0.7	0.6	0.3	0.4

Pre-1980 housing units in Indiana and surrounding states

A key risk factor for lead poisoning is exposure to lead-based paint. Lead-based paint is typically found in housing built prior to 1978, the year in which the manufacture of lead-based paint intended for residential use was prohibited by federal legislation. According to the 2009 American Community Survey data, nearly 2 million (74%) of housing units in Indiana were built prior to 1980 (data is presented in 10-year increments; this is the nearest time-point to 1978 from which to derive estimates). Figure 12 on the following page maps pre-1980 housing in Indiana by county. Only one county (Hamilton) has less than 40% of its available housing built before 1980; 75 (82%) of Indiana's 92 counties have 41 – 80% of housing stock built before 1980; 16 Indiana counties have over 80% of their available housing built prior to 1980. (See page 11 for map of pre-1980 housing units in Indiana.)

In comparison with surrounding states, Indiana has the highest percentage of housing stock built before 1980 (74%) yet the statewide lead poisoning rates is lower (0.3 in 2010). The figure below illustrates EBLL rates and percentage of pre-1980 housing for Indiana, Ohio, Michigan, Kentucky and Illinois (all EBLL rates are 2010 except for Illinois – only 2009 EBLL rate was available). *(Note: EBLL rates below are for children 6 and under, not 7 and under as mentioned elsewhere in this report.)*

Figure 11



Percentage of pre-1980 housing units in Indiana

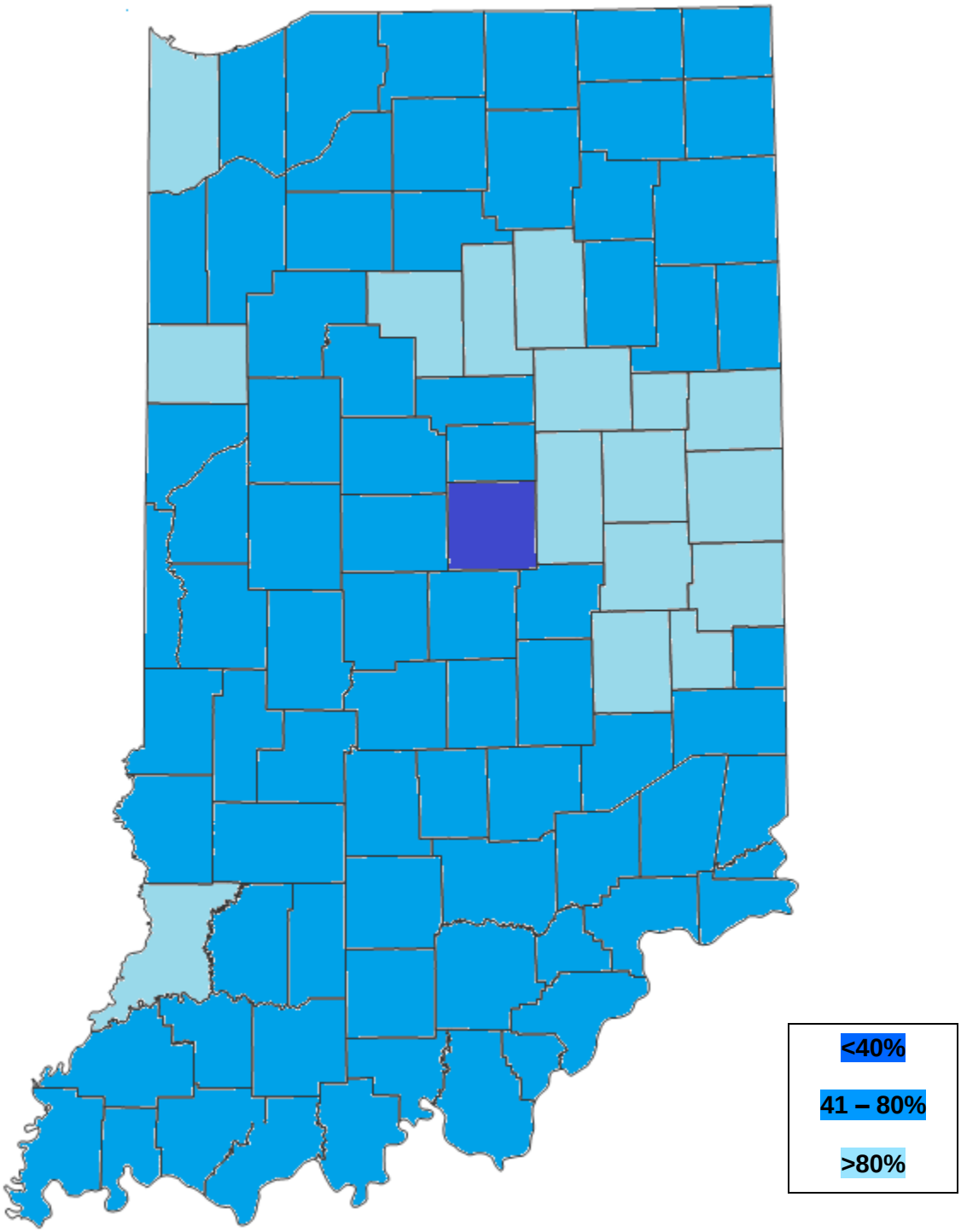


Figure 12

Lead poisoning in Medicaid-eligible children

In alignment with federally-mandated standards, Indiana requires that children receiving Medicaid benefits be screened for blood lead poisoning at the ages of 1 and 2 and anytime during the 3rd through 5th years if not previously tested.

Like the non-Medicaid population, data from 2011 reveal that children who received Medicaid benefits illustrate racial disparity among the American Indian/Alaskan Native group experienced lead poisoning at over six times the rate of White children.

Table 2 (Lead poisoning in Medicaid-eligible children)

Age in Months	Medicaid-eligible Children Screening Rate (%)	BLL >= 10 mµ/dL (%)
6 - 12	40.0	0.1
6 - 24	20.8	0.8
12 - 36	23.7	1.0
12 - 72	16.0	1.2
Sex (ages 48 - 84 months)	**Medicaid-eligible Children Screening Rate (%)**	**EBLL >= 10 mµ/dL (%)**
Female	3.99	1.28
Male	4.32	1.17
Race	**Medicaid-eligible Children Screening Rate (%)**	**EBLL >= 10 mµ/dL (%)**
White	6.8	1.2
Black	10.3	1.9
AI/AN***	15.4	12.5
Asian/Pacific Islander	8.3	0.8
Other	6.9	0.0
Ethnicity	**Medicaid-eligible Children Screening Rate (%)**	**EBLL >= 10 mµ/dL (%)**
Hispanic	17.5	0.4

***AI/AN = American Indian/Alaskan Native

Lead poisoning in Medicaid-eligible children, cont'd.

Nearly half (47%) of all children aged 7 and under in Indiana were enrolled in Medicaid in 2011. Of those children with an EBLL, 63% were Medicaid recipients. The screening rate for the Medicaid population was 20% in 2011. This represents an increase from 2010 – 14% -- but is far from optimal; ILHHP continues to work with the Office of Medicaid Policy and Planning (OMPP) to increase testing rates among children under the requirements of the Medicaid EPSDT program (Hoosier Healthwise).

Lead poisoning rates for Medicaid recipients continue to decline as well but remains higher than the overall lead poisoning rate (0.4 µg/dL *vs.* 0.9 µg/dL respectively).

Figure 13

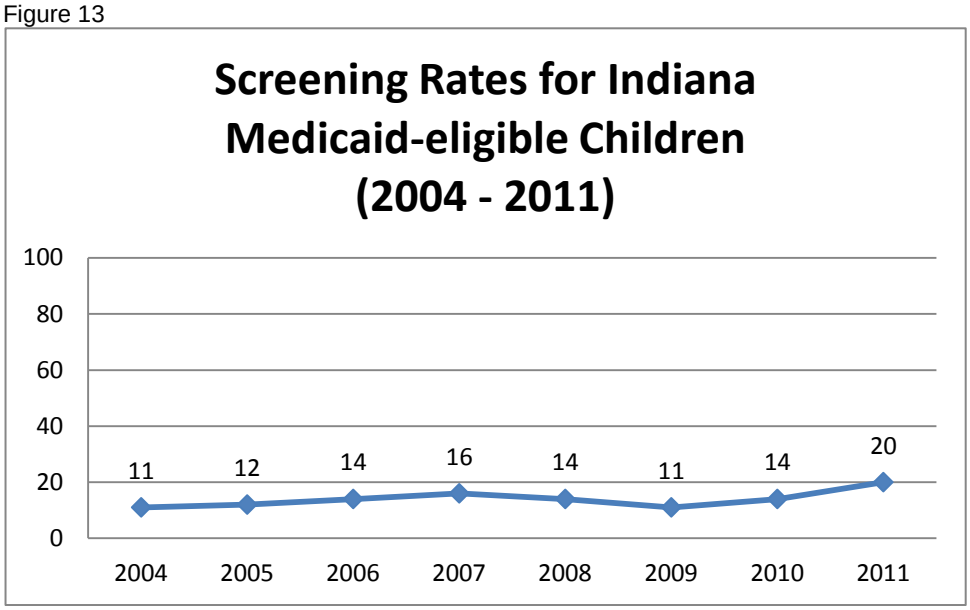
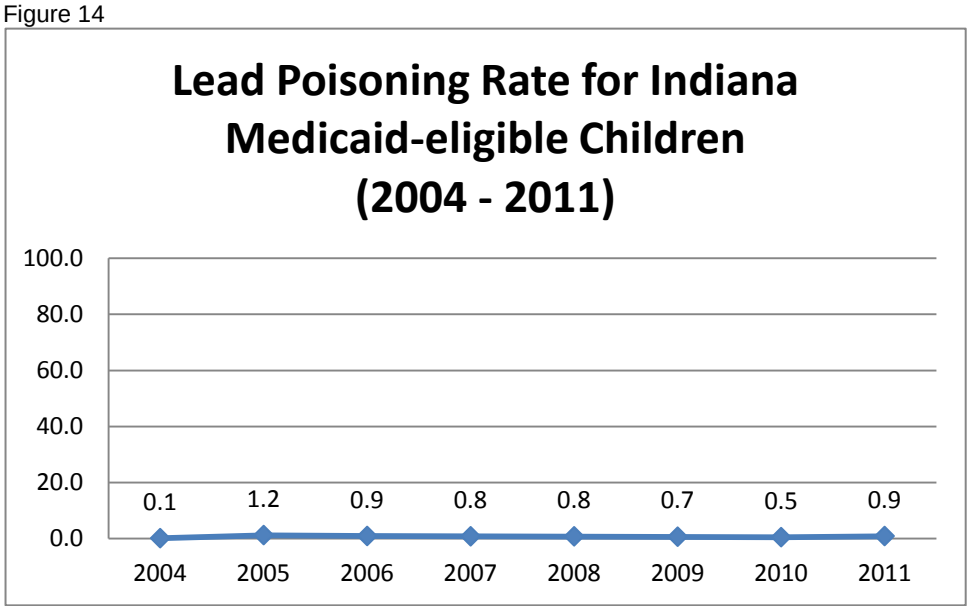


Figure 14



Required county-level data

Table 3 (Required county-level data)

County	Tests	Total EBLL[1]	Unconfirmed EBLL[2]	Confirmed EBLL[3]	False positives[4]	Avg # Days to confirm	Risk assessments performed	Hazard(s) identified	Hazard(s) remediated
Adams	198	0	0	0	0		12	5	1
Allen	2703	78	<5	76	19	77	52	33	9
Bartholomew	822	<5	<5	<5	0		0	0	0
Benton	83	<5	0	<5	<5	3	0	0	0
Blackford	114	<5	<5	<5	<5		11	9	2
Boone	310	10	0	10	<5		4	2	1
Brown	99	0	0	0	0		0	0	0
Carroll	110	11	<5	7	<5		1	1	1
Cass	446	5	0	5	<5		2	2	0
Clark	1032	12	<5	10	<5	4	2	1	0
Clay	177	5	0	5	<5		2	0	0
Clinton	237	16	7	9	<5	1	4	2	1
Crawford	178	0	0	0	0		0	0	0
Daviess	201	8	<5	6	<5		5	3	1
Dearborn	230	0	0	0	0		5	4	1
Decatur	189	<5	0	0	0	0	0	0	0
Dekalb	0	0	0	0	0	0	0	0	0
Delaware	1000	16	7	9	6	2	6	4	1
Dubois	99	<5	0	<5	0		2	1	0
Elkhart	5408	105	13	92	17	19	54	30	56
Fayette	272	8	0	8	<5		2	2	1
Floyd	668	<5	<5	<5	0		0	0	1
Fountain	95	<5	0	<5	<5	58	2	2	1
Franklin	192	<5	0	<5	0		0	0	0
Fulton	95	5	0	0	0		1	1	
Gibson	230	<5	<5	<5	<5	88	2	0	2

County	Tests	Total EBLL	Unconfirmed EBLL[1]	Confirmed EBLL[2]	False positives[3]	Avg # Days to confirm	Risk assessments performed	Hazard(s) identified	Hazard(s) remediated
Grant	634	<5	<5	<5	<5		2	1	0
Greene	349	0	0	0	0		3	1	0
Hamilton	947	7	<5	5	<5	23	3	1	0
Hancock	158	0	0	0	0		4	0	0
Harrison	490	0	0	0	0		0	0	1
Hendricks	299	<5	<5	<5	<5		2	0	0
Henry	454	22	<5	20	7		14	1	0
Howard	878	8	<5	6	<5		24	23	16
Huntington	271	<5	0	<5	0		3	2	1
Jackson	346	<5	<5	<5	0		7	7	3
Jasper	234	0	0	0	0		2	2	0
Jay	170	<5	0	<5	<5		3	0	1
Jefferson	315	8	<5	7	0		5	5	0
Jennings	168	<5	0	<5	<5		15	12	10
Johnson	546	7	<5	6	<5		4	2	1
Knox	242	6	0	6	<5		15	6	1
Kosciusko	443	<5	0	<5	0		1	0	1
Lagrange	121	<5	0	0	0	0	0	0	0
Lake	4929	110	20	90	26	19	60	48	15
LaPorte	885	11	<5	8	<5		8	5	2
Lawrence	679	5	<5	<5	<5		7	1	3
Madison	1119	20	<5	17	5		16	12	4
Marion	12023	138	11	127	54		388	245	7
Marshall	372	7	<5	6	<5		0	0	0
Martin	105	0	0	0	0	0	0	0	0
Miami	243	0	0	0	0	0	0	0	0
Monroe	2112	7	<5	6	<5	20	4	2	0
Montgomery	344	<5	<5	<5	0		2	1	1
Morgan	430	7	5	<5	0	0	0	0	0
Newton	88	0	0	0	0	0	0	0	0

County	Tests	Total EBLL	Unconfirmed EBLL[1]	Confirmed EBLL[2]	False positives[3]	Avg # Days to confirm	Risk assessments performed	Hazard(s) identified	Hazard(s) remediated
Noble	246	<5	<5	<5	<5	0	0	0	0
Ohio	15	0	0	0	0		0	0	0
Orange	263	<5	<5	<5	<5		3	0	2
Owen	406	6	<5	5	<5		1	0	0
Parke	71	0	0	0	0	0	0	0	0
Perry	122	0	0	0	0	0	0	0	0
Pike	45	0	0	0	0		2	0	0
Porter	873	<5	0	<5	<5		2	1	0
Posey	196	5	0	5	<5		1	0	0
Pulaski	65	0	0	0	0	0	0	0	0
Putnam	295	5	0	5	<5		1	1	0
Randolph	88	7	<5	5	<5	12	4	4	10
Ripley	334	10	<5	9	<5	14	4	1	1
Rush	81	<5	<5	<5	0		4	2	0
Scott	206	<5	0	<5	<5	22	0	0	0
Shelby	178	<5	0	<5	0	0	0	0	0
Spencer	224	<5	0	<5	<5		1	1	1
St Joseph	4178	104	12	92	20		69	52	0
Starke	167	<5	<5	0	0	0	0	0	0
Steuben	360	<5	0	<5	<5		1	1	0
Sullivan	100	0	0	0	0		7	4	0
Switzerland	54	0	0	0	0		1	1	1
Tippecanoe	1758	9	0	9	<5	27	24	11	13
Tipton	55	0	0	0	0		1	1	1
Union	97	<5	0	<5	0	0	0	0	0
Vanderburgh	2092	34	7	27	5	57	20	9	4
Vermillion	100	<5	0	<5	<5		1	1	1
Vigo	1331	48	<5	45	9		8	7	0

County	Tests	Total EBLL	Unconfirmed EBLL[1]	Confirmed EBLL[2]	False positives[3]	Avg # Days to confirm	Risk assessments performed	Hazard(s) identified	Hazard(s) remediated
Wabash	279	<5	<5	<5	<5		1	0	0
Warren	38	0	0	0	0		1	0	0
Warrick	295	<5	0	<5	0		5	0	1
Washington	232	<5	0	<5	0		2	0	0
Wayne	1346	62	13	49	13		14	11	5
Wells	195	<5	<5	<5	<5	64	3	2	1
White	118	<5	0	<5	<5				
Whitley	129	<5	0	<5	0		1	1	0
Unknown	1433	5	<5	<5	<5		0	0	0
TOTAL	**64044**	**1020**	**152**	**868**	**247**		**941**	**587**	**187**

[1]Unconfirmed tests include: child did not return for confirmatory test; child not required to return for confirmatory test at the time this report due to differences in reporting requirements depending upon blood lead level

[2]Confirmatory test may be either a second capillary or a single venous test

[3]False positives are those tests which initially demonstrate EBLL but are found to not be elevated upon confirmatory testing

Glossary

The sources for these definitions are the Medical Dictionary Online (http://www.online-medical-dictionary.org/) noted as [1], the Centers for Disease Control and Prevention Epidemiology Glossary (http://www.cdc.gov/reproductivehealth/epiglossary/glossary.htm#I) noted as [2], The Free Dictionary (http://www.thefreedictionary.com/) noted as [3], the National Center for Healthy Housing (http://www.nchh.org/What-We-Do/Healthy-Homes-Principles.aspx) noted as [4], the Centers for Disease Control and Prevention Lead home page (http://www.cdc.gov/nceh/lead/) noted as [5], the online article "The Biochemistry and physiology of vitamin D" (http://vitamind.ucr.edu/biochem.html), noted as [6].

Blood/brain barrier: Specialized cells that form a transport barrier between the cerebral capillaries and the brain tissue. [1]

Case management: traditional term for all the activities which a physician or other health care professional normally performs to insure the coordination of the medical services required by a patient so that care is continuous and comprehensive. [1]

Colic: Paroxysms of pain. This condition usually occurs in the abdominal region but may occur in other body regions as well. [1]

Confirmed test: a second capillary or a single venous test performed to confirm a blood lead level.

Deciliter: a metric unit of volume equal to one tenth of a liter. [3]

Encephalopathy: any degenerative disease of the brain (often associated with toxic conditions). [3]

Elevated blood lead level (EBLL): An elevated blood lead level in a child is defined as 10 or more micrograms of lead per deciliter (µg/dL) of blood. [5]

Erythrocyte protoporphyrin: genetic disorder of the biosynthesis of the heme -pathway. It causes a severe photosensitivity to visible light. [1]

False positive: a blood test which initially demonstrates an EBLL but which is found to not be elevated upon confirmatory testing.

Frank anemia: name for anemia when the blood lead level is significantly elevated for prolonged periods. [5]

Hemoglobin synthesis: requires the coordinated production of heme and globin. Heme is the prosthetic group that mediates reversible binding of oxygen by hemoglobin. Globin is the protein that surrounds and protects the heme molecule. [1]

Incidence: A measure of the frequency with which an event, such as a new case of illness, occurs in a population over a period of time. [2]

Lead poisoning: Lead poisoning occurs when blood lead levels are equal to or greater than 10 µg/dl (micrograms per deciliter). [5]

Glossary, cont'd.

Medicaid-eligible: those children who are enrolled in Medicaid but who may or may not have used Medicaid services.

Microgram: A unit of mass equal to one thousandth (10^{-3}) of a milligram or one millionth (10^{-6}) of a gram. [3]

Nephropathy: kidney disease. [3]

Nerve conduction velocity: the speed at which an electrochemical signal propagates down a neural pathway. [1]

Primary prevention: prevention of disease in susceptible individuals or populations through promotion of health and specific protection, such as immunization, as distinguished from the prevention of complications or after-effects of existing disease. [1]

Proportion: A type of ratio in which the numerator is included in the denominator. The ratio of a part to the whole, expressed as a ``decimal fraction'' (e.g., 0.2), as a fraction (1/5), or, loosely, as a percentage (20%). [2]

Risk assessment: The qualitative or quantitative estimation of the likelihood of adverse effects that may result from exposure to specified health hazards. [1]

Seven principles of healthy housing: Homes that are *Dry***:** Damp houses provide a nurturing environment for mites, roaches, rodents, and molds, all of which are associated with asthma; *Clean:* Clean homes help reduce pest infestations and exposure to contaminants; *Pest-Free:* Recent studies show a causal relationship between exposure to mice and cockroaches and asthma episodes in children; yet inappropriate treatment for pest infestations can exacerbate health problems, since pesticide residues in homes pose risks for neurological damage and cancer; *Safe:* The majority of injuries among children occur in the home. Falls are the most frequent cause of residential injuries to children, followed by injuries from objects in the home, burns, and poisonings; *Contaminant-Free:* Chemical exposures include lead, radon, pesticides, volatile organic compounds, and environmental tobacco smoke. Exposures to asbestos particles, radon gas, carbon monoxide, and second-hand tobacco smoke are far higher indoors than outside; *Ventilated:* Studies show that increasing the fresh air supply in a home improves respiratory health; *Maintained:* Poorly-maintained homes are at risk for moisture and pest problems. Deteriorated lead-based paint in older housing is the primary cause of lead poisoning, which affects some 240,000 U.S. children. [4]

Surveillance: The systematic collection, analysis, interpretation, and dissemination of health data on an ongoing basis, to gain knowledge of the pattern of disease occurrence and potential in a community, in order to control and prevent disease in the community. [2]

Glossary, cont'd.

Unconfirmed test: a blood test not confirmed by a second capillary or a single venous test. Tests may be counted a as unconfirmed for a variety of reasons, including when a child is not required to return for confirmatory test until a certain time period has elapsed or when a child moves out of the area.

Vitamin D metabolism: the break down of vitamin D_3 by the liver to $25(OH)D_3$, for transfer to other organs. [6]